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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,360	01/17/2006	Thomas Kley	4590-416	2655
33308 7590 03/11/2009 LOWE HAUPTMAN & BERNER, LLP 1700 DIAGONAL ROAD, SUITE 300 ALEXANDRIA, VA 22314				
EXAMINER				
LEE, BENNY T				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/537,360

**Applicant(s)**

KLEY ET AL.

**Examiner**

Benny Lee

**Art Unit**

2817

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 05 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-27 is/are rejected.
- 7) ☒ Claim(s) 14 and 28-31 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 January 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

The substitute specification filed 5 January 2009 has been considered, found acceptable and has replaced the original specification.

The disclosure is objected to because of the following informalities in the substitute specification filed 5 January 2009: Page 6, lines 12, 15, 16, note that it is unclear what features are intended by the respective recitation of "it can rotate". Pages 9, 11, note that in the descriptions of Figures 4, 5, 6, 7, 19 & 20, the respective description of these drawing figures still appear to be excessive (i.e. contains description which is more suited for the detail description) and thus should be amended (i.e. by deleting unnecessary text) to be more in line with a brief description of the drawings. Page 12, lines 11, 12, note that "15 ... 19 ... in Figures 4 and 5" should be rewritten as to be commensurate with the corresponding labeling in each one of Figures 4 & 5 for clarity of description. Page 16, line 25, note that for "gearbox unit 42", the reference to "Figure 10" does not appear appropriate as should reference --Figures 8, 9-- for an appropriate characterization. Page 18, line 18, note that "21 ... 24" should be rewritten as --21, 22, 23, 24-- for consistency with the labeling in the corresponding drawing figures; line 33, note that reference label "F'" does not appear to be consistent with the labeling in any drawing figure and needs clarification. Page 20, line 1, note that reference to "band 4" is still vague in meaning and needs clarification. Pages 21, 22, in the table, note that the following symbols used in the specification description need to be rewritten to be inclusive of all reference labels: (15 ... 19); (21 ... 24); (61 ... 64); (A1 ... A4). Appropriate correction is required.

Claims 2-6, 16-19, 23-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, note that reference to “a planar, round circular disk” does not appear consistent with the “ring-like dielectric resonator element” as recited in amended claim 1, thereby rendering the claim as vague in meaning with respect as to whether the “circular disk” can properly define from a “ring-like dielectric resonator element”. Clarification is needed.

In claim 16, it is noted that it is unclear how “a motor mounting plate” as recited herein relates to “the motor mounting plate” as previously recited in claim 14, from which this claim directly depends (i.e. the same plate, a different plate, etc). Clarification is needed.

In claim 18, note that use of the term “preferably ...” renders the respective claim vague and indefinite in that it is unclear whether the preferable feature is intended to be a positive narrower limitation of an earlier recited broader limitation. Clarification is needed.

In claim 23, it is noted that it is unclear, even in light of the specification, what characterizes “a vertical center plane of the cavities to be coupled”. Clarification is needed.

In claims 24, 25, note that it is unclear which ones of the recited dielectric bodies is intended by the recitation of “the dielectric (resonator) bodies”. Clarification is needed.

The following claims have been found to be objectionable for reasons set forth below:

In claim 1, line 3, note that the recitation of “each of which” should be rephrased for an appropriate description; line 5, note that “the axis of the cutout is offset from the axis” should be rephrased as --the cutout has an axis which is offset from an axis-- for an appropriate characterization.

In claim 5, line 3, note that --the-- should precede “dielectric bodies” to avoid potential lack of antecedent basis.

In claim 20, line 3, note that --respectively-- should be inserted prior to “arranged” for an appropriate characterization.

In claim 22, line 2, note that --of the filters-- should be inserted after “each” for clarity of description.

In claim 23, note that the status identifier should be correctly identified as **--Currently amended--** rather than **“Previously Presented”**.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 7, 8, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishikawa et al (of record) in view of Yamakawa et al.

Nishikawa et al discloses a radio frequency filter (e.g. Figs. 24-26) comprising: a filter body defining a plurality of dielectric resonant elements (e.g. dielectric cylindrical portions 106, 107, 108) spaced apart from each other to define in conjunction with upper and lower lids (102, 103) a plurality of filter cavities. However, the plurality of dielectric resonant elements do not include a ring like dielectric resonator element having a respective eccentric cutout in which a

corresponding dielectric tuning element can be rotatably received therein to adjust the resonant frequency of the filter.

Nishikawa et al (e.g. Fig. 36) discloses a tuning mechanism for an exemplary dielectric resonant element (4), which includes two eccentric (i.e. offset from the center of the resonant element) cutouts or partial through holes located in the dielectric resonant element (4). A dielectric tuning body (e.g. dielectric rod 165) is insertable into and out of the cutouts to provide adjustment of the resonant frequency. The respective dielectric rods (165) are attached to a corresponding metallic portion (166) passing through a respective aperture (163) located in an upper case plate (162) as depicted generally in Fig. 33. As described in column 18, lines 35-46, the aperture (163) and corresponding metallic portion (166) define a threaded assembly, such that, in operation, the threaded metallic portion (166), can be rotated about a rotation axis to thereby provide a corresponding rotation and linear insertion along the rotation axis of dielectric rods (165) into and out of the cutouts in the dielectric resonant element (4) to thereby adjust the resonant frequency of the filter structure.

Yamakawa et al (e.g. Fig. 1(b) discloses a dielectric resonator filter comprising dielectric resonators having a ring-like configuration (i.e. 4, 5) and a dielectric resonator having a solid disk configuration. Note that as depicted with respect to Fig. 3(a) & Fig. 3(b), there are disclosed ring-like dielectric resonator having diameter (d) and solid disk dielectric resonators having a diameter (d=0), respectively. As described with respect to Figs. 6 & 7(a)-7(d), it is noted that the formation of an inner hole (i.e. in a disk shape dielectric resonator) causes the spurious frequencies to be dispersed depending on the increase in the diameter of the inner hole (e.g. see column 7, lines 1-21).

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the plural resonant elements (106, 107, 108) in the Fig. 24 embodiment of Nishikawa et al to have included respective cutouts and corresponding dielectric tuning rods or bodies (such as those taught in Fig. 36 of Nishikawa et al). Such a modification would have been considered obvious since it would have imparted the advantageous benefit of the ability of tuning a dielectric filter, which previously was not tunable, thereby suggesting the obviousness of such a modification. Additionally, it would have been obvious in view of the teaching in Yamakawa et al to have further modified the solid disk shape dielectric resonator in Nishikawa et al to have included a centrally located inner hole as to have provided an ring-like dielectric resonator. Such a modification would have been considered obvious since it would have imparted to the dielectric resonator in Nishikawa et al the benefit of providing dispersal of spurious modes, provided by the presence of the inner hole (as taught by Yamakawa et al), as compared to a dielectric resonator, without an inner hole (i.e. a solid dielectric resonator), thereby suggesting the obviousness of such a modification. Moreover, with respect to claim 8, as known to those of ordinary skill in the art, by selecting the dielectric material of the dielectric resonant element and the dielectric tuning body to have been the same material, one of ordinary skill in the art would have provided optimal matching of thermal expansion characteristics (i.e. same material expand/contract at the same rate), thereby suggesting the obviousness of such a modification. Furthermore, with respect to claim 20, as known to those of ordinary skill in the art, the number of cavities can obviously be selected depending on the desired degree of frequency filtering (e.g. the more the cavities, the more refined is the frequency response), thereby suggesting the obviousness of such a modification.

Claims 9, 12, 13, 15, 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 1 and further in view of Cavey (of record).

The filter of the above obviousness combination discloses the claimed invention except for a motor mounting plate and wall plates, which separate individual cavities.

Cavey (e.g. Fig. 4) discloses an exemplary tunable filter structure, which includes a plurality of dielectric resonator elements (e.g. dielectric puck 3) disposed within a housing having partition (i.e. walls) separating the dielectric resonator elements into individual cavities (e.g. 6). Moreover, note that the cavity housing includes an upper plate upon which a tuning assembly, including a stepping motor (13) which is provided to be mechanically connected, via an opening in the upper plate of the housing, to a tuning element (e.g. a movable dielectric puck 2) disposed within a respective cavity adjacent a corresponding dielectric resonator element or puck (3) to thereby tune the resonant frequency of the respective cavities. Additionally, it should be noted that the stepping motors are controlled by or responsive to a controller, such as a computer (i.e. CPU) and a network analyzer, which can determine the tuning conditions and stores such tuning conditions in various memory devices (e.g. EEPROM 19) for subsequent use (e.g. the stored information may be in the form of preset tuning information, such as in a table or the stored information may be dynamically controlled via an input through a keyboard (17) as described in column 6, lines 14, 15). Additionally, it should be noted that optical sensors (e.g. IR sensors) can be used by the CPU to digitally control the stepping motors to provide the desired degree of frequency tuning.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have further modified the filter of the above obviousness combination to have included walls



which partition the separate dielectric resonators into individual cavities and to have provided stepping motors for controlling the rotational and linear movement of the dielectric tuning rods (165) within the cutouts in the corresponding dielectric resonators, in view of the exemplary teaching thereof by Cavey. Such modifications would have been considered obvious since they would have imparted to the above obviousness combination the benefits of automatically control of tuning through the use of stepping motors, as well as providing a precise resonant frequency through the use of individual cavities, thereby suggesting the obviousness of such modifications.

Claims 21, 22, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 1, above and further in view of Wenzel et al (of record).

The filter of the above obviousness combination meets the claimed invention except for the filter cavities being arranged in a four square configuration and that the filter housing is formed by a sheet metal construction.

Wenzel et al (e.g. Fig. 1) exemplarily discloses a filter configuration having four cavities (e.g. 28) configured in a square shape configuration. Furthermore, Fig. 17 discloses a housing formed by a sheet metal construction, where the walls of the housing are assembled and secured to each other.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have further modified the above obviousness combination to have configured the cavities in a four cavity square configuration, such as taught by Wenzel et al. Such a modification would have been considered an obvious substitution of art recognized equivalent cavity filter configurations known to those of ordinary skill in the art and whose configuration is dependent on desired filtering characteristics, thereby suggesting the obviousness of such a modification. Moreover,

the use of sheet metal to form a cavity filter housing would have been considered an obvious design consideration providing the benefit of light weight construction, as known to those of ordinary skill in the art, thereby suggesting the obviousness of such a modification.

Claims 10, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above rejection as applied to claim 9 above, and further in view of Wenzel et al (of record).

The filter of the above combination discloses the claimed invention except for the filter being formed by conductive plates being plugged into one another.

Accordingly, it would have been obvious in view of the references, taken as a whole, to have modified the filter of the above combination to have been formed by a sheet metal construction in which the filter housing is assembled by plugging together the conductive plates, such as exemplarily taught by Fig. 17 of Wenzel et al. Such a modification would have been considered obvious since it would have provided the benefit of constructing the housing in a simple manner (i.e. plugging plates into one another), thereby suggesting the obviousness of such a modification. It is noted that as an obvious consequence of forming the cavities using the sheet metal construction, such construction provides for opening between the cavities for coupling purposes, such as exemplarily taught by Fig. 17 of Wenzel et al, thereby suggesting the obviousness of such a modification.

Applicant's arguments with respect to claims 1, 2, 4, 5, 8, 10, 11, 20-22, 27 have been considered but are moot in view of the new grounds of rejection.

Claims 16-19, 23 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 14, 28-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to Benny Lee at telephone number 571 272 1764.

**/BENNY LEE/  
PRIMARY EXAMINER  
ART UNIT 2817**

B. Lee